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UNIT 4 - Session 9
React Native Overview

Summary of Session 8

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Quick review of all concepts:

1. What is React
2. React.createElement
3. Create React App Command
4. What is NPM and Node.js
5. Testing with Jest
6. JSX Components
7. Class Components
8. Functional Components
9. Component Lifecycle
10. Properties (Props) Explained
11. State Explained
12. React Hooks
13. Deconstructing
14. Conditional Rendering
15. PropTypes and Defaults
16. Nested Components
17. Handling Events
18. Lifting State Up
19. React Routes
20. Fragments
21. React Forms

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Goals for Unit 5 - Session 9

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1. What is Native App Development
2. React Native Explained
3. Alternatives to React Native
4. Reactjs Vs React Native
5. Expo Cli Tool Chain
6. Creating a React Native App
7. Viewing React Native using Emulators

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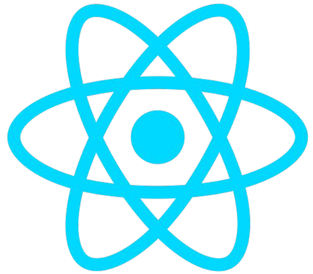
React Native



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Native App Development

Native App Development

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What is Native App Development?

- A native mobile app is one that is **installed directly** on the smartphone and can work (in most cases) without an internet connection

- They are built for **specific platforms** and written in languages that the platform accepts

Platform		**Languages**
○ **iOS apps**	=>	Swift and Objective-C
○ **Native Android apps**	=>	Java or Kotlin
○ **Windows**	=>	Xamarin and WPF in .NET

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Native App Development

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The Benefits of Developing Native Apps:

- Deliver the best performance (over mobile web apps or hybrid ‘progressive’ solutions)
- They have complete support from the app stores and the overall app marketplace
- Possible quality assurance though ratings in application stores
- They can run more smoothly in terms of user input and output; broad functionalities due to using the capabilities of the underlying device

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Native App Development

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Advantages Continued...

- They allow developers to access the full features of the selected operating system
- A UI that better matches with user experiences of the OS
- Fast and responsive software performance
- Push notifications
- You can charge money for an app

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Native App Development

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Some of the Disadvantages:

- They require experienced developers with knowledge of the specific programming languages
- They can be expensive compared to the non-native alternatives
- They require multiple code bases because each device has its own version of the app
- The cost for additional developers to build and manage a code base for each platform; and time spent on multiple builds for separate platforms in each feature update

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What is React Native?

What is React Native?

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- React Native is an open-source JavaScript framework for writing real, natively rendering mobile applications for iOS and Android.
- Created by Facebook in 2015.
- It’s based on React, Facebook’s JavaScript library for building user interfaces, but instead of targeting the browser, it targets mobile platforms.
- Some companies that use React Native in production:

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React Native

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How Does It Work?

- React Native brings React's declarative UI framework to iOS and Android. With React Native you use native UI controls and have full access to the native platform.

- Also, because most of the code you write can be shared between platforms, React Native makes it easy to simultaneously develop for both Android and iOS.

- Similar to React for the Web, React Native applications are written using a mixture of JavaScript and JSX.

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React Native

- Under the hood, the React Native bridge invokes the native rendering APIs in Objective-C (for iOS) or Java (for Android).
- This means your application will render using real mobile UI components (not web).
- With React Native an app should look and feel like any other mobile application.
- JavaScript interfaces are provided for platform APIs which will enable your app to access platform features like phone camera or the users location.

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React Native Pros and Cons

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Pros:

- Fast Iteration: Auto reloading, when you change the code it reloads instantly on the emulator. This makes it faster to develop and you don't have to keep re-compiling your code.
- Cross Platform Code: Code can be shared across devices.
- Dynamic Code Updates: React Native is unique in its ability to push updates to devices without requiring an app release.
- Simplified UI using declarative programming.

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React Native Pros and Cons

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Cons:

- Navigation between screen not as smooth as a fully native application
- Still breaking changes in tools and dependencies between versions. You may find debugging clunky
- If you want to implement some native features and modules you will still need knowledge of native application languages

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Alternatives to React Native

Alternatives to React Native

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- There are alternative to React Native development right now and it's important to be aware of them.

Flutter:

- A popular alternative to React Native. Flutter is based on the Dart programming language and implements cross-platform features. Dart might be easier for Java or C# developers.

Ionic:

- Ionic Is based on rendering an app inside a WebView, which can be a slower approach.

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Alternatives to React Native

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Xamarin:

- Uses C# for mobile app development and compiles the code into native controls

NativeScript with Angular or Vue.js:

- Is a framework that allows development of mobile apps using web frameworks like Angular or Vue.js

Progressive Web App:

- Developing a hybrid web application with the ability to work offline could be an alternative to a native app

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Reactjs vs React Native

Differences from Reactjs

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- **Reactjs** is a JavaScript library, which can be used to create a UI Layer
- **React Native** is an entire framework for building cross-platform apps, be it web, iOS or Android
- **Reactjs** uses a virtual DOM to render code to a browser
- **React Native** uses native APIs to render components to a mobile
- **Reactjs** uses **CSS** for styling
- **React Native** uses stylesheets

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Differences from Reactjs

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- **Reactjs** animation is possible through **CSS**
- **React Native** an animated API is needed for producing animation across different components of the React Native applications
- Use **Reactjs** for building dynamic and responsive UI for web interfaces
- Use **React Native** for a native feeling apps for mobiles

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Expo CLI for App Development

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Expo CLI

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What is Expo?

- Expo is free, open-source tool-chain built around React Native to help developers build iOS and Android projects using JavaScript and React

https://expo.io/tools

What is Expo CLI

- Expo CLI is a command line app that is the main interface between a developer and Expo tools

- You can use it for a variety of tasks e.g. Creating projects, creating and running projects, viewing logs and opening in a simulator

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Expo CLI

- You can use the CLI in your terminal or use the web based interface
- The web interface enables you to use some of the most often used features from a quick-to-use graphical interface

https://expo.io/tools

Setting Up the Development Environment

- Requirements are Node.js (Node 12 LTS) and a phone emulator
- Check your version of node from the command line:

```
> node --version
```


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Expo CLI

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- Install the Expo CLI command line utility using npm or yarn:

```
> npm install expo-cli --global
```

- Once installed, check the version to see if installation completed

```
> expo --version
```

- To create a new React Native project run the following command:

```
> expo init mynativeapp
```

- or alternatively you can run

```
> npx create-react-native-app <folder-name>
```


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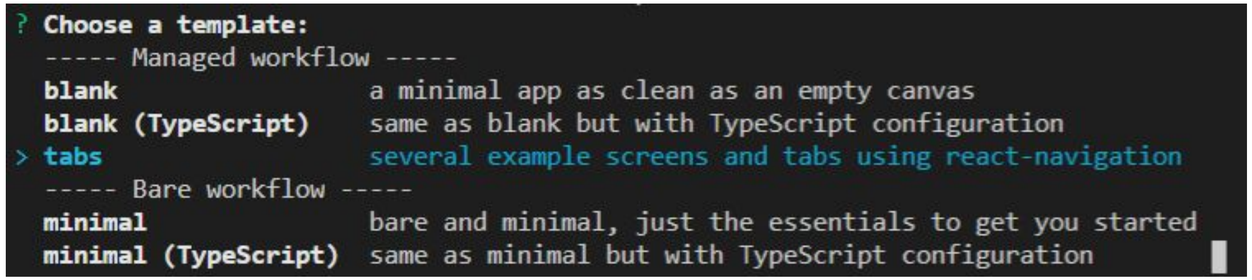
Running React Native

- When installing React Native using Expo, you will be asked to select the type of install. Select the tabs option from the list of templates.



- Once installed the app can be run through the following commands:

```
> cd mynativeapp
> npm start
```

- This will start the development version of the application. You can then view the application from your mobile (scan the QR code) or through an installed emulator

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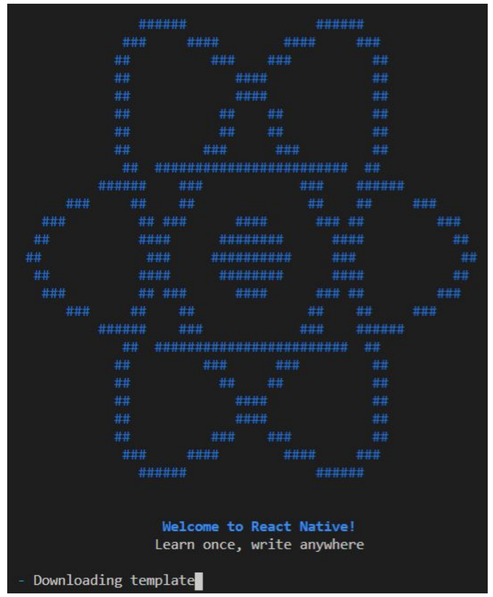
Pure React Native Application

- It’s important to note that you can build a **Pure React Native App** without the Expo tool-chain by initializing with the command:

```
> npx react-native init <projectname>
```

- Once installed there are instructions on how to run on various systems




```
√ Downloading template
√ Copying template
√ Processing template
√ Installing dependencies

  Run instructions for iOS:
    • cd "C:\Users\efuaa\cbf\black-codher-bootcamp\unit06-react-and-react-native\draft\instructor\prnbookviewer" && npx react-native run-
ios
    - or -
    • Open prnbookviewer\ios\prnbookviewer.xcodeproj in Xcode or run "xed -b ios"
    • Hit the Run button

  Run instructions for Android:
    • Have an Android emulator running (quickest way to get started), or a device connected.
    • cd "C:\Users\efuaa\cbf\black-codher-bootcamp\unit06-react-and-react-native\draft\instructor\prnbookviewer" && npx react-native run-
android

  Run instructions for Windows and macOS:
    • See https://aka.ms/ReactNative for the latest up-to-date instructions.
```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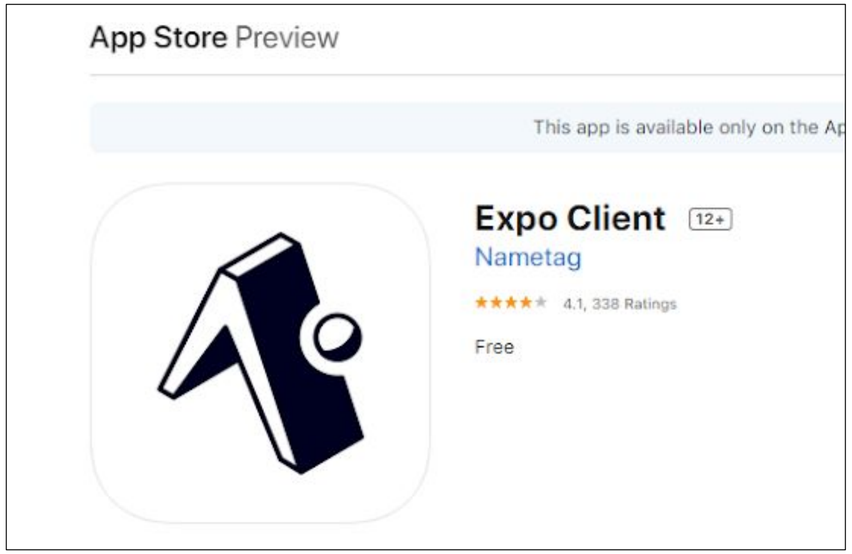
Install Expo Client on Mobile

- Install Expo client app on your iOS or Android phone: https://expo.io/
- Connect to the wireless network on your computer



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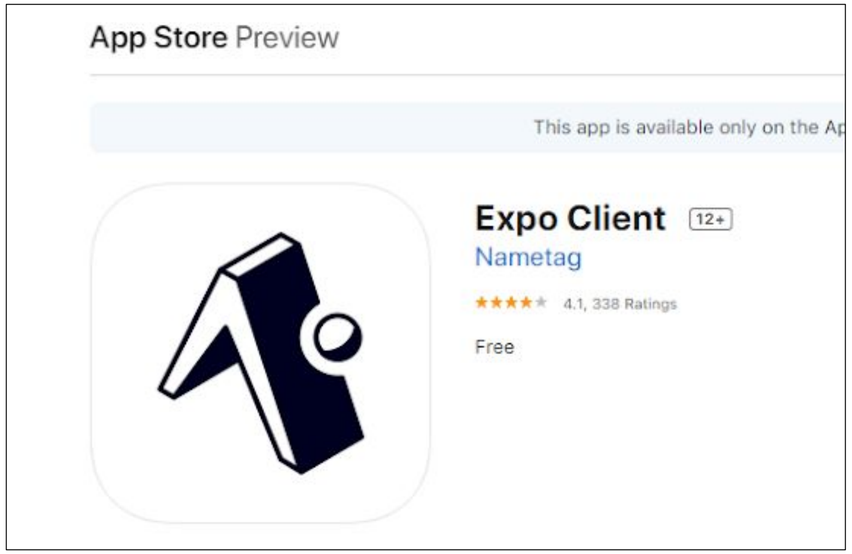
Install Expo Client on Mobile

- Ensure you app has started using `> npm start`
- Once started scan the QR code printed on the command prompt/terminal window



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Emulators

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Installing Android Emulator

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What is an Emulator?

- Emulators are hardware or software that enables one computer system to behave like another computer system.
- Emulators are helpful for testing purposes; they enable developers to see how a program behaves on different systems.
- Expo CLI allows you to run your React Native app on a physical device without setting up a development environment.
- However you can install phone emulators for Android and iOS (Mac Only!)

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Installing Android Emulator

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Installing an Android Emulator

- To install the android emulator which will enable you to test your React Native app on an android device on your computer visit the android developer site and download Android Studio (it's a large download!):

https://developer.android.com/studio.

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Exercise: Install Android Emulator

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Installing Android Emulator

- Once downloaded, double-click the exe to launch it

- If you downloaded a .zip file, unpack the ZIP, copy the android-studio folder into your Program Files folder, and then open the android-studio > bin folder and launch studio64.exe (for 64-bit machines) or studio.exe (for 32-bit machines)

- Follow the setup wizard in Android Studio and install any SDK packages that it recommends

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Running Android Emulator

- After installing Android Studio and running the Native App you can launch the emulator from a browser window.
- Ensure you have the Emulator SDK as part of the system path environment variables: https://docs.expo.io/workflow/android-studio-emulator.
- Open Android Studio app and click on the Virtual Device icon 
- From the Android Studio main screen, go to Configure -> AVD Manager

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Running Android Emulator

- Select a virtual device (ensure all actions have been taken e.g. Download required device images – this may take awhile!) *
- Once complete, you should be able to launch the emulator.
- Once the emulator is launched you should be able to Run on Android device /emulator.

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Running Android Emulator

- If you have an Android mobile/tablet device, you can also run the app by scanning the QR code or opening via a link you email.

- To install the iOS emulator you will need XCode Software Development Environment (this is only available on the Mac).

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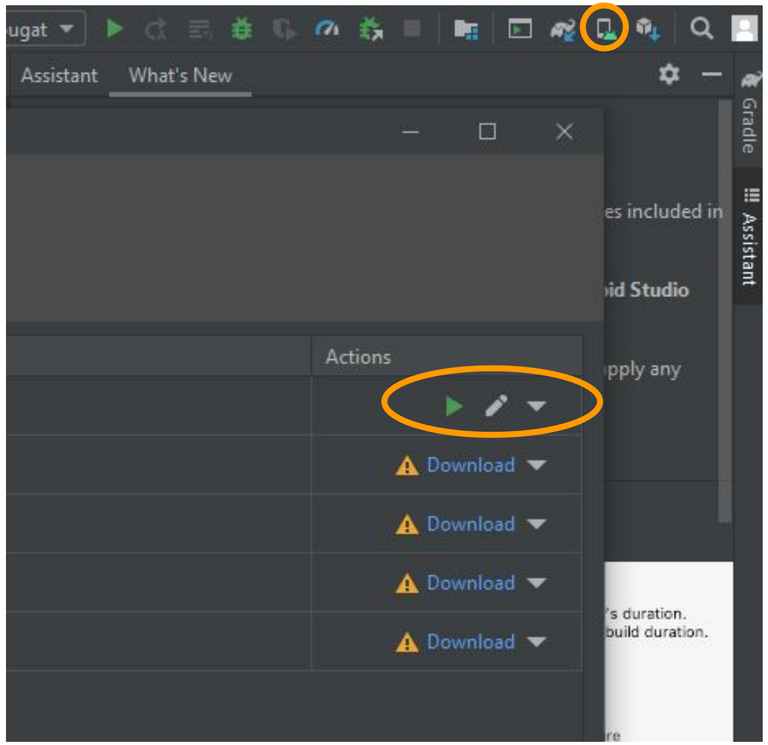
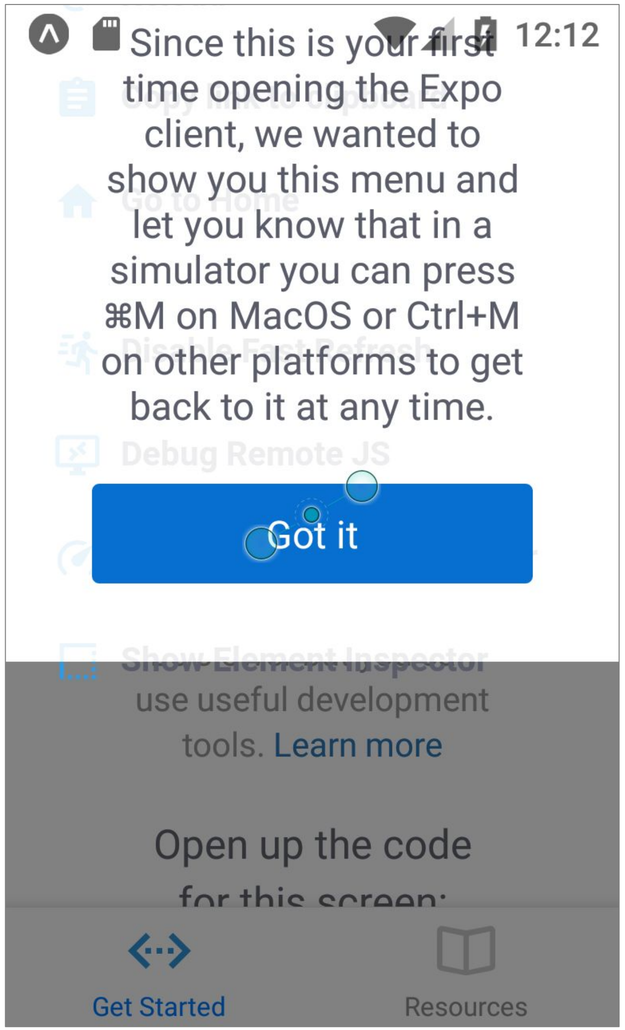
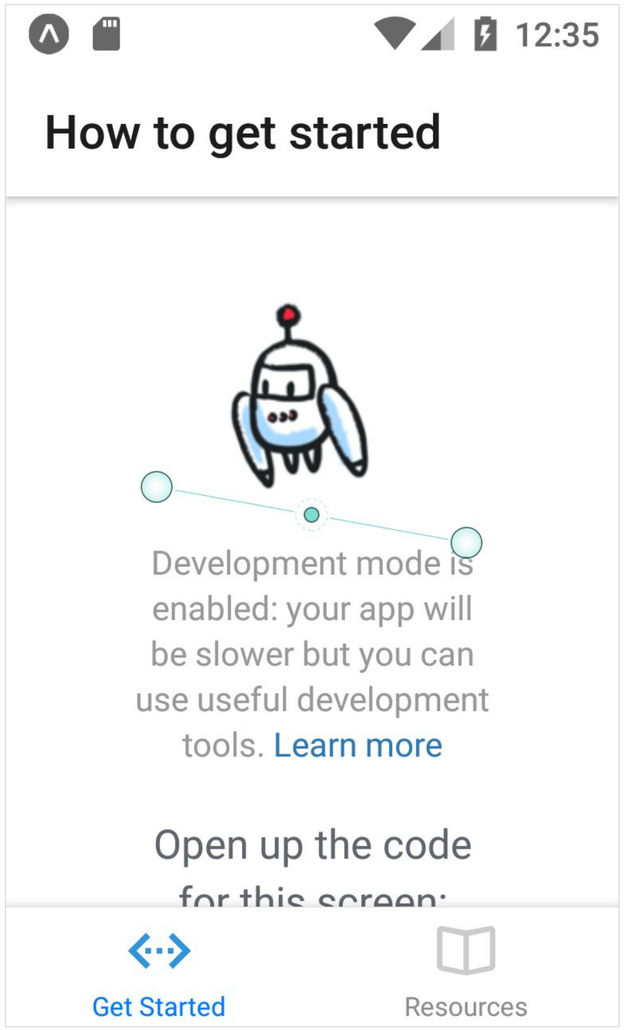
Running Android Emulator







Summary of Session 9

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